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UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF PUBLIC ROADS  
DIVISION OF AGRICULTURAL ENGINEERING

S. H. McCORMICK, CHIEF

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PUBLIC ROADS  
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MONTHLY NEWS LETTER

WASHINGTON, D. C., SEPTEMBER 20, 1929

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THE BUREAU HAS IN STOCK A SUPPLY OF  
FIELD NOTEBOOKS SIMILAR IN GENERAL TO K & E  
Nos. 360 AND 361. SUCH FIELD NOTEBOOKS AS  
ARE REQUIRED BY THE FIELD FORCE SHOULD BE  
ORDERED FROM THE WASHINGTON OFFICE AND NOT  
PURCHASED IN THE FIELD.  
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THE ADVISORY COUNCIL FOR THE NEW FARM STRUCTURES RESEARCH PROJECT HEADED BY PROFESSOR HENRY GIESE, MET IN WASHINGTON AUGUST 27. AT THIS MEETING PROFESSOR GIESE OUTLINED THE PROCEDURE THAT HE PROPOSES TO FOLLOW WHILE ACTING AS DIRECTOR. THIS PROGRAM WAS APPROVED BY THE COUNCIL. THE MEMBERSHIP OF THIS COUNCIL IS MADE UP OF REPRESENTATIVES OF THE DEPARTMENT, AND OF SEVERAL OF THE TRADE ASSOCIATIONS AND FARMERS' ORGANIZATIONS THAT ARE INTERESTED IN RESEARCH DIRECTED TOWARD SECURING BETTER AND MORE ECONOMICAL STRUCTURES FOR THE FARM. THE MEMBERS AT THE MEETING EXPRESSED THEMSELVES AS TO THE VIEWPOINTS OF THEIR RESPECTIVE ORGANIZATIONS REGARDING THIS PROBLEM.

WHILE IN WASHINGTON IN CONNECTION WITH THE STRUCTURES RESEARCH COUNCIL MEETING, PROFESSOR GIESE GAVE A BRIEF RADIO ADDRESS AT STATION WRC ON AUGUST 23, WHICH WAS BROADCAST THROUGH THE NATIONAL BROADCASTING COMPANY. THE ADDRESS EMPHASIZED THE IMPORTANCE OF SUITABLE AND ECONOMICAL STRUCTURES AS A PART OF THE FARMER'S PLANT.

W. W. McLAUGHLIN REPORTS AS FOLLOWS CONCERNING A PROJECT BEING CARRIED ON BY THIS DIVISION IN COOPERATION WITH THE UTAH EXPERIMENT STATION, COVERING DRAINAGE OF WATERLOGGED LAND ABOVE AN ARTESIAN BASIN:

THE AREA REFERRED TO IS IN CACHE VALLEY, UTAH, AND IS SURROUNDED BY IRRIGATED FARMS AND TRAVERSED BY SEVERAL IRRIGATION CANALS AND DITCHES. CACHE VALLEY IS A MOUNTAIN-FILL AREA, THE SOILS OF WHICH WERE LAID DURING SEVERAL STAGES OF THE NOW EXTINCT LAKE BONNEVILLE. THUS THERE ARE SEVERAL LAYERS OF GRAVEL AND OVERLYING SILT. THE SURFACE LAYER OF FINE MATERIAL IS ABOUT 40 FEET IN THICKNESS AND THE UNDERLYING GRAVEL FROM A FEW FEET TO 20 OR 30 FEET IN THICKNESS. WATER STANDS AT THE SURFACE OF THE GROUND EXCEPT DURING THE MID-SUMMER SEASON, IN THE AREA BEING STUDIED, AND THE ONLY VEGETATION THAT CAN EXIST IS WATER-

the first time I have seen it. It is  
a very large tree, and has a  
large trunk, and a large head.  
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LOVING PLANTS AND GRASSES. ATTEMPTS HAD BEEN MADE TO DRAIN THESE LANDS, BUT WITHOUT SUCCESS. DURING THE WORLD WAR, DRAINAGE DISTRICTS WERE FORMED, ENGINEERING INVESTIGATIONS MADE, PRELIMINARY PLANS PREPARED FOR THE DRAINAGE OF THESE LANDS, BUT CONSULTING ENGINEERS COULD NOT AGREE AS TO THE FINAL PLANS FOR DRAINAGE. THE SOURCE OF THE WATER CAUSING THE WATERLOGGING HAD NOT BEEN DETERMINED. CACHE VALLEY IS TRAVERSED BY TWO OR THREE FAULT PLANES AND THESE FAULTS MAY BE ONE SOURCE OF WATER SUPPLY TO THE GRAVEL BEDS. WATER IS ALSO PROBABLY ADMITTED TO THE GRAVEL IN LARGE QUANTITIES THROUGH THE FRINGE OF THE VALLEY FLOOR ADJACENT TO THE MOUNTAINS.

THE PROCEDURE FOLLOWED BY OUR INVESTIGATORS HAS BEEN AS FOLLOWS: IN ONE OF THE WORST WATERLOGGED AREAS AND WHERE THE CAPPING OF FINE MATERIAL WAS SOME 40 FEET IN THICKNESS, SMALL IRON PIPES WERE FORCED INTO THE CLAY CAPPING MATERIAL TO DEPTHS OF FROM 5 TO 35 FEET IN 5-FOOT INTERVALS OF DEPTH. THE LOWER ENDS OF THESE PIPES WERE IN PERMEABLE PUMICE CONES. THE PRESSURE OF WATER IN THESE SEVERAL PIPES WAS READ AND THUS WAS DETERMINED THE FORCE NECESSARY TO CAUSE THE WATER TO MOVE UP THROUGH EACH FIVE-FOOT LAYER OF THE SILT. IT WAS ALSO DETERMINED THAT THE SOURCE OF WATER CAUSING THE WATERLOGGING WAS FROM THE ARTESIAN SUPPLY. THROUGHOUT THIS ARTESIAN AREA NUMEROUS SMALL PIPES HAVE BEEN DRIVEN INTO THE GRAVEL AND PRESSURE READINGS MAINTAINED. WITHIN A RELATIVELY SMALL AREA, SEVERAL 2-INCH, 3-INCH AND 4-INCH WELLS HAVE BEEN DRIVEN INTO THE GRAVEL, WHICH CAN BE CLOSED AND OPENED AT WILL. AS A RESULT OF THESE OPENING WELLS, SPRINGS THAT HAVE BEEN FLOWING FOR AT LEAST HALF A CENTURY WITHOUT INTERRUPTION, AND WELLS THAT HAVE BEEN FLOWING FOR YEARS ARE DRIED UP. PRESSURES HAVE BEEN REDUCED OVER MUCH OF THE AREA. IT IS EVIDENT FROM THE RESULTS OF THIS EXPERIMENTAL WORK THAT THESE LANDS ARE WATERLOGGED BY THE UPWARD FLOW OF ARTESIAN WATER AND THAT THEY CAN BE DRAINED BY REDUCING THE PRESSURE WITHIN THE ARTESIAN BASIN.

THIS DIVISION RECENTLY WAS CALLED UPON BY THE BUREAU OF PLANT INDUSTRY TO MAKE A SURVEY FOR A RESERVOIR AND CANAL SYSTEM TO UTILIZE THE FILTER WASTE WATER FROM THE CHEYENNE CITY WATER WORKS, FOR THE GREAT PLAINS EXPERIMENT STATION OF THAT BUREAU. THIS STATION COVERS AN AREA OF APPROXIMATELY 3,000 ACRES, AND IS LOCATED ABOUT SIX MILES WEST OF CHEYENNE. IT IS A DRY LAND EXPERIMENT STATION BUT SOME IRRIGATION EXPERIMENTS ARE PLANNED AND THERE IS ALSO NEED FOR A SUPPLY OF SUPPLEMENTAL WATER TO START CERTAIN CROPS AND PROVIDE WATER FOR THE TREE-PLANTING AND HORTICULTURAL EXPERIMENTS. CARL ROHWER WAS ASSIGNED THE WORK OF MAKING THE SURVEY, AND PREPARING MAPS FOR FILING AN APPLICATION FOR WATER RIGHTS IN ACCORDANCE WITH THE LAWS OF THE STATE OF WYOMING.

ON AUGUST 5 R.L. PARSHALL MADE A TRIP TO THE ARKANSAS VALLEY, WHEN THE ARKANSAS RIVER WAS AT FLOOD STAGE, FOR THE PURPOSE OF OBTAINING HIGH MEASUREMENTS ON THE DISCHARGE THROUGH THE 40-FOOT IMPROVED VENTURI FLUME ON THE FORT LYON CANAL. TWO MEASUREMENTS WERE OBTAINED, ONE AT A DISCHARGE OF 1,305 SECOND-FEET, WHERE THE COMPUTED DISCHARGE, ACCORDING TO THE FORMULA DEVELOPED AT THE TIME THE STRUCTURE WAS DESIGNED, WAS 1,298 SECOND-FEET, OR A DEVIATION OF 0.5, AND THE OTHER AT 1,390 SECOND-FEET WITH A COMPUTED DISCHARGE OF 1,377 SECOND-FEET, OR A DEVIATION OF 0.9. IN 15 CHECK MEASUREMENTS ON THE DISCHARGE THROUGH THIS STRUCTURE VARYING FROM 130 SECOND-FEET TO APPROXIMATELY 1,600, THE MEAN DEVIATION IS ABOUT 1 PER CENT. THE VENTURI FLUME, DEVELOPED BY MR. PARSHALL AND HIS ASSISTANTS, IS NOW BEING SATISFACTORILY USED IN MANY PARTS OF THE WORLD.



THE CIVIL SERVICE COMMISSION HAS ANNOUNCED EXAMINATIONS IN THE GRADES OF AGRICULTURAL ENGINEER, ASSOCIATE AGRICULTURAL ENGINEER, AND ASSISTANT AGRICULTURAL ENGINEER, APPLICATIONS FOR WHICH CLOSE OCTOBER 9. FROM THE ELIGIBLE LISTS ESTABLISHED IT IS EXPECTED THAT ONE OR MORE ENGINEERS WILL BE ADDED IMMEDIATELY TO THE FORCE DEALING WITH THE SOIL EROSION PROJECT. THE EXAMINATION IS IN THREE PARTS, RELATING RESPECTIVELY TO SOIL EROSION, FARM STRUCTURES, AND FARM MACHINERY.

A. L. FELLOWS HAS SUBMITTED HIS FINAL ESTIMATE FOR WORK DONE BY GOULD & HERRIN INC., IN CONSTRUCTING COLD SPRINGS CREEK DAM, CUSTER COUNTY, SOUTH DAKOTA. THIS IS A PROJECT OF THE BUREAU OF BIOLOGICAL SURVEY, THE ENGINEERING FOR WHICH WAS DONE BY THIS DIVISION.

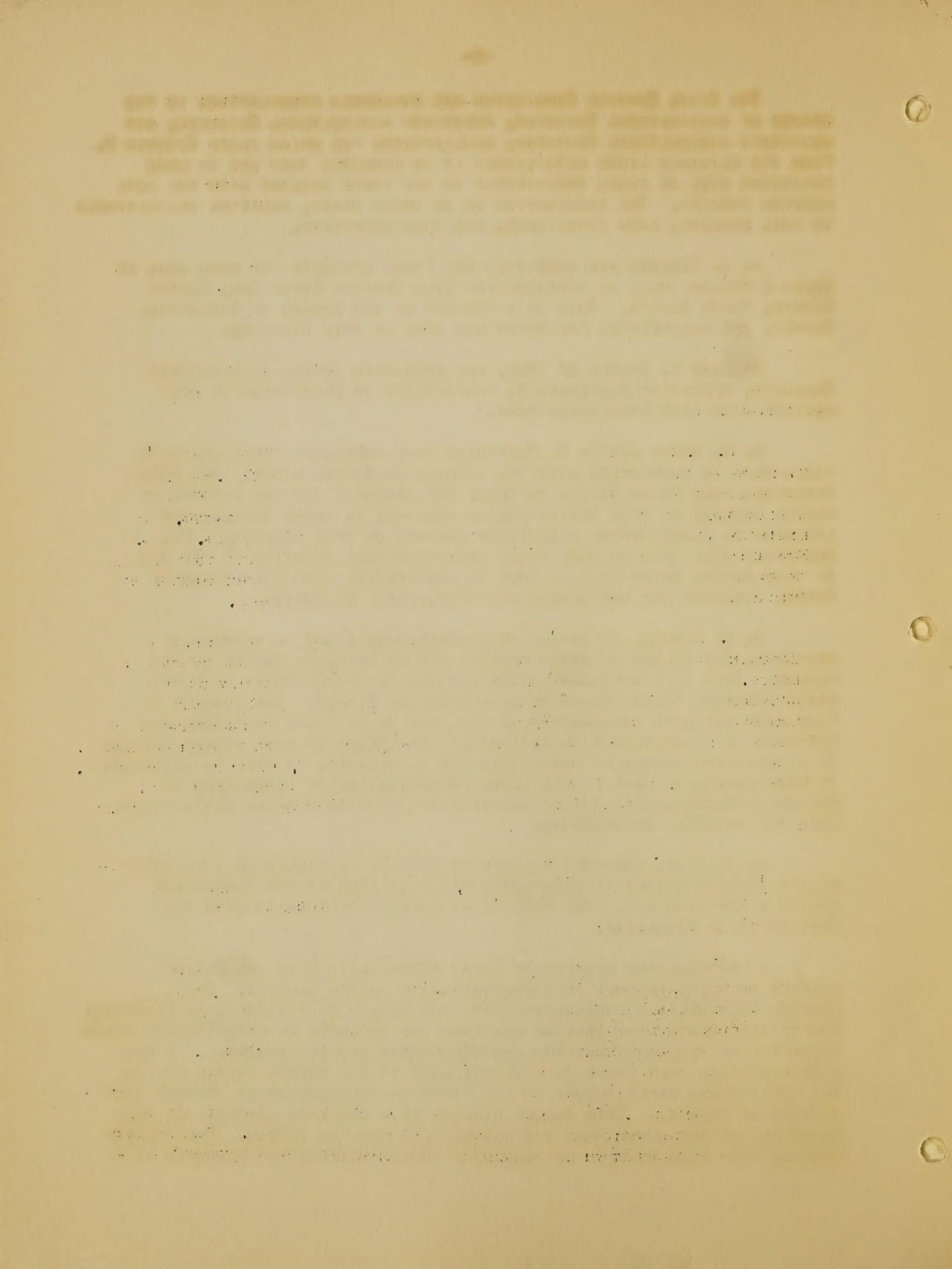
WILLIAM H. CARTER OF IOWA, WAS APPOINTED JUNIOR AGRICULTURAL ENGINEER, EFFECTIVE SEPTEMBER 3, FOR SERVICE IN WASHINGTON IN CONNECTION WITH FARM STRUCTURES WORK.

W. M. HURST AND W. R. HUMPHRIES HAVE COMPLETED THEIR SEASON'S FIELD WORK IN CONNECTION WITH THE COMBINE HARVESTER STUDY. MR. HURST PROCEEDED FROM NORTH DAKOTA TO TEXAS AND ARKANSAS FOR THE PURPOSE OF MAKING STUDIES OF RICE DRYING NOW IN PROGRESS IN THOSE STATES, PRELIMINARY TO ESTABLISHING A DIVISION PROJECT ON THIS SUBJECT. MR. HUMPHRIES WILL TAKE UP SOME FIELD INVESTIGATIONS RELATING TO THE USE OF FARM POWER, WHICH WILL BE DONE IN COOPERATION WITH THE BUREAU OF ANIMAL INDUSTRY AND THE BUREAU OF AGRICULTURAL ECONOMICS.

D. L. YARNELL IS MAKING AN EXPERIMENTAL STUDY OF METHODS OF MEASURING THE VOLUME OF WATER FLOWING ACROSS RAILROAD TRACKS DURING FLOODS. THIS IS A SECONDARY STUDY CARRIED ON CONCURRENTLY WITH HIS MAJOR PROJECT, "FLOW AROUND BENDS AND BRIDGE PIERS". THE SUBJECT OF FLOW OVER RAILROAD EMBANKMENTS IS ONE THAT IS OF GREAT PRACTICAL IMPORTANCE IN CONNECTION WITH ESTIMATING THE VOLUME OF FLOW DURING FLOODS. IF A PRACTICAL METHOD OF DOING THIS CAN BE DEVISED, IT WILL BE POSSIBLE, IN MANY CASES, TO MAKE A VERY CLOSE APPROXIMATION OF FLOOD FLOW BY MAKING MEASUREMENTS AT BRIDGE OPENINGS AND AT POINTS WHERE WATER FLOWS OVER THE RAILROAD EMBANKMENTS.

J. A. WISE, FORMERLY ASSOCIATED WITH D. G. MILLER ON TILE DURABILITY INVESTIGATIONS IN MINNESOTA, WAS A VISITOR AT THE WASHINGTON OFFICE A FEW DAYS AGO. MR. WISE IS AT PRESENT AFFILIATED WITH THE UNIVERSITY OF MINNESOTA.

A FAR-REACHING PROJECT OF GREAT POSSIBILITIES TO THE COTTON PLANTER IS BEING PLANNED IN CONNECTION WITH COTTON GINNING. THE PROGRAM CONTEMPLATES COOPERATION WITH THE BUREAU OF AGRICULTURAL ECONOMICS AND CERTAIN STATE EXPERIMENTAL STATIONS AND INCLUDES AN EXPERIMENTAL STUDY IN DETAIL OF THE PROCESSES AND EQUIPMENT INVOLVED IN GINNING. IT HAS BEEN DEVELOPED THAT THERE IS CONSTANT LOSS TO THE COTTON GROWER DUE TO THE CUTTING AND OTHER INJURY TO THE FIBER AS PRODUCED UNDER PRESENT CONDITIONS OF GINNING. THIS INJURY RESULTS IN A DISTINCT LOWERING OF THE GRADE AND OF THE PRICE THAT THE FARMER GETS FOR HIS COTTON. PRELIMINARY WORK ON THIS PROJECT WILL BE CONDUCTED DURING OCTOBER AND NOVEMBER AT A



NUMBER OF COMMERCIAL GINS, THE PROPRIETORS OF WHICH HAVE INDICATED GREAT INTEREST IN THIS UNDERTAKING. C. A. BENNETT WILL BE ASSIGNED TO THIS PROJECT.

THE HEADQUARTERS OF RAYMOND R. DRAKE HAVE BEEN MOVED FROM GUTHRIE, OKLA., TO HAYS, KANSAS, FOLLOWING HIS ASSIGNMENT TO THE THIRD SOIL EROSION EXPERIMENT FARM LOCATED AT THE FORT HAYS SUB-STATION OF THE KANSAS AGRICULTURAL EXPERIMENT STATION.

S. J. DENNIS MADE A BRIEF VISIT DURING THE EARLY PART OF THE MONTH TO PITTSFIELD AND BOSTON, MASS., TO ASSIST THE PLANT QUARANTINE AND CONTROL ADMINISTRATION IN THE MECHANICAL PROBLEMS CONNECTED WITH THE HIGH POWER SPRAY MACHINERY USED IN COMBATING THE SPREAD OF THE GYPSY MOTH.

THE WASHINGTON OFFICE HAS LEARNED, WITH DEEP REGRET, OF THE DEATH ON SEPTEMBER 15, OF MRS. R. B. GRAY. WE EXTEND TO MR. GRAY OUR SINCERE SYMPATHY IN HIS BEREAVEMENT.

THE FOLLOWING BULLETINS OF THIS DIVISION HAVE BEEN PUBLISHED RECENTLY OR WILL BE AVAILABLE IN THE NEAR FUTURE:

- FINANCIAL SETTLEMENTS OF DEFAULTING IRRIGATION ENTERPRISES,  
BY WELLS A. HUTCHINS. (DEPT. CIRC. 72).
- MAKING CELLARS DRY, BY GEO. M. WARREN. (F. B. 1572)
- LOW-CUTTING DEVICES FOR HARVESTING CORN. BY FRANK IRONS.  
(MISCELLANEOUS PUBLICATION 56.)
- A STUDY OF THE OIL BURNER AS APPLIED TO DOMESTIC HEATING.  
BY A. H. SENNER. (TECH. BUL. 109).
- FLOW OF WATER IN DREDGED DRAINAGE CHANNELS. BY C. E. RAMSER  
(REVISION OF DEPT. BUL. 832)
- OPERATION AND CARE OF THE COMBINED HARVESTER THRESHER,  
BY W. M. HURST, (F.B. 1608)

IN ADDITION TO THE ABOVE MISS FORBES, OUR LIBRARIAN, REPORTS RECEIPT OF THE FOLLOWING PUBLICATIONS PREPARED IN COOPERATION WITH THIS DIVISION OR BY MEN ASSOCIATED WITH OUR WORK:

- THE COMBINED HARVESTER-THRESHER IN NORTH DAKOTA, 1929. BY  
A. H. BENTON, W. R. HUMPHRIES, W.M. HURST AND OTHERS.  
(N. D. STA. BUL. 225)

- A FARM MACHINERY SURVEY OF SELECTED DISTRICTS IN PENNSYLVANIA,  
BY H. B. JOSEPHSON, W. R. HUMPHRIES AND L. M. CHURCH.  
(PENN. STA. BUL. 237)

- IRRIGATION DISTRICTS IN CALIFORNIA. BY FRANK ADAMS. (STATE OF CAL. DEPT. OF PUB. WORKS. REPTS. OF DIV. OF ENG. & IRRIG.  
BUL. 21)

- SOIL MOISTURE AT PERMANENT WILTING OF PLANTS, BY F.J. VEITHMEYER  
& A. H. HENDRICKSON. (REPRINTED FROM PLANT PHYSIOLOGY, 3:)

